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SPECIAL ARTICLES

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EDUCATIONAL POSSIBILITIES

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The Activated Sludge Process of Sewage Disposal

GEORGE G. NASMITH, C.M.G.

Presented at the 35th Annual Meeting, Engineering Institute of Canada, Toronto, February 2nd, 1921.

IN discussing any system of sewage disposal it is necessary to know exactly what that system is capable of doing under the very best of conditions, and, what is of even more importance, to be sure of what it is likely to accomplish under average conditions. We need to know, in fact, not only the best but the worst features of any system.

An ideal system of sewage disposal should turn out a clear and stable effluent and an easily dewatered, inoffensive sludge; it should accomplish these results without causing offense during the operation and at the minimum cost. In practice a sewage disposal scheme is usually, unfortunately, a compromise between the results desired and the money available for building the plant.

At present there are three inoffensive method of sewage disposal that are capable, when carefully operated, of yielding a clear, stable effluent and a non-putrescible sludge. These are combinations of:

1. Sedimentation tanks, sludge digestion and trickling filters;
2. Imhoff or Travis tanks and trickling filters;
3. Activated sludge process and sludge digestion (or drying the activated sludge by centrifugal action, sludge presses and other means.)

The two first combinations are well-known and though the inoffensive digestion of sludge in separate single chambered tanks presents some difficulties, it can be, and is being done on a very large scale as at Birmingham and Baltimore.

THE ACTIVATED SLUDGE PROCESS.

The activated sludge process now being developed is the subject of this brief review. Activated sludge, prepared by long continued agitation of sludge with air, is a brown, flocculent, gelatinous material largely composed of living bacteria possessing certain definite characteristics, and is capable of bringing about profound modifications in fresh sewage when agitated with it in the presence of air for a considerable length of time. After such treatment the settled sewage effluent is clear and practically all of the suspended and dissolved organic matter has been entrapped or converted into inorganic matter by the activated sludge. At the same time most of the bacteria have been removed from the sewage while the effluent has been rendered non-putrescible and comparatively innocuous.¹

The activated sludge process is in itself relatively simple. The apparatus consists of tanks containing a quantity of activated sludge previously prepared, means for introducing air at the bottom of the tanks for aerating and agitating the mixture of activated sludge and incoming sewage, and other tanks or compartments for allowing the activated sludge to separate from the liquids. Mechanical means for agitating the mixture of activated sludge and sewage in presence of air will yield exactly the same results as agitation by means of compressed air, and experimental work now being carried on indicates the probability of such methods coming to the front in the near future.

The activated sludge process will, when the simple but essential conditions of operation are carefully observed, yield a clear, sanitary, non-putrescible effluent. The excess of activated sludge produced is, however, still putrescible, can at present not be cheaply or easily dewatered, and is difficult to dispose of. Should the dewatering problem be economically solved the activated sludge process of sewage disposal would immediately become more desirable and feasible than it is at present, chiefly for the reason that activated sludge has a high fertilizing value and is therefore, valuable from the standpoint of conservation. The activated sludge process as carried out at present, though embodying many good features, has some undesirable ones, and is by no means the last word in sewage disposal.

ADVANTAGES OF THE ACTIVATED SLUDGE PROCESS.

The advantages of the activated sludge process of sewage disposal are, first—that the plant is comparatively simple in construction, consisting, as it does, of a series of tanks and means for injecting finely divided air at the bottom of the same. Second—that it will produce in the one operation an effluent that can be obtained in other systems only by a combination of operations. Third—that it is, during operation quite inoffensive, and fourth—that it can be carried on with the minimum amount of pumping.

Viewed from the standpoint of inoffensiveness, simplicity of operation and stable effluent, a combination of two-storey tanks and trickling filters may be quite as satisfactory as the activated sludge process. In fact, such a combination may be highly desirable where plenty of fall would make the operation almost automatic, where expert assistance is unobtainable or where economic considerations would make the activated system undesirable or even impossible.¹

DISADVANTAGES OF THE ACTIVATED SLUDGE PROCESS.

The inherent disadvantages of the activated sludge process over other combinations are not negligible,² Where improperly operated, the effluent is neither stable nor sanitary. Disinfectants and certain trade wastes are liable to destroy the activated sludge; under these circumstances it will take weeks to build up again the necessary volume of activated sludge. The filtros plates used for finely dividing the injected air are subject to plugging with smoke and dust,³ in which case the areas of sludge not agitated are apt to undergo anaerobic decomposition, while there are inherent difficulties with air blowers and other mechanical features of the aeration system. Though attempts have been made to derive an income from the dried activated sludge as a fertilizer, the hope entertained have not as yet been realized in practice and it is doubtful if the day has yet arrived when the chemist or sanitary engineer is honestly justified in advising that an activated sludge system be constructed with the guarantee that the increased cost of the plant or the high cost of operation will be compensated for by the sale of sludge or other material derived from the process.

On the other hand, some cheap method of satisfactorily dewatering the sludge may entirely change our viewpoint in regard to this matter. The activated sludge system is unsuitable for

small communities or large institutions where an automatic system is highly desirable. ⁴ and ⁵

PRESENT TENDENCIES IN REGARD TO THE SLUDGE PROBLEM.

With one group of investigators the object is to eliminate at the beginning of any process of sewage disposal as much of the organic sewage matter as possible in the form of sludge, and to leave an effluent which is finished or can be finished at a high rate of speed or is good enough to be disposed of after disinfection or without further treatment. ⁶ Such objectives are included in chemical precipitation processes and the activated sludge process, both of which necessitate the further disposal of enhanced quantities of sludge. For example, treatment with sulphurous acid at Lawrence gives an increase of 32% in the dried sludge over that obtained by plain sedimentation. ⁷

With another group of investigators, the object is actually to convert into stable compounds and gases, through the destructive biological action of bacteria and other forms of life, as much as possible of the organic matter present in the sewage, leaving for final treatment the smallest possible quantity of stable sludge.

It is possible that both of these objectives may ultimately be included in the same system with entirely satisfactory results.

The questions of greatest interest to us at the present time are—a: whether this dewatering problem is soon likely to be solved, and—b: whether the problem of digesting sludge without offence and cheaply will revolutionize other methods and, if so, which will then be the more desirable process. And the present time we are unable to answer these questions. Huge works as at Birmingham ⁸ and Baltimore ⁹ have been constructed where a combination of plain sedimentation tanks, double-storey tanks, sludge digestion tanks and trickling filters are operating on a gigantic scale. On the other hand, activated sludge systems with a capacity of fifteen million gallons a day appear to be working satisfactorily in Houston, Texas; ¹⁰ while Milwaukee has committed itself to a municipal plant counting, it may be said, on a revenue from the sale of the dried activated sludge for fertilizing purposes to reduce the otherwise high cost of operation.

THE DEWATERING OF SLUDGE.

The dewatering of sludge can only be brought about in two ways, viz.: the expression of the bulk of the water present by pres-

sure methods such as the sludge press—a very cumbersome and objectionable process—or through the more recent method of centrifugal action. Both of these methods will produce a sludge cake containing from 75% to 80% moisture from which the remaining moisture must be removed by heat.

A centrifuge of the Basco Ter Meer type has been experimented with for a month at Milwaukee and promises to be more suitable for dewatering Milwaukee activated sludge than sludge presses. The machine is almost automatic in operation, occupies 15 minutes for each cycle, and will centrifuge from 2,000 to 4,000 U. S. gallons of sludge per hour. It takes a sludge containing 98½% moisture and reduces the moisture to from 79% to 85%. About 20% of the solids of the sludge pass over in the filtrate and it is expected that, with experience and improvements, it will prove more efficient and satisfactory than any type of sludge press hitherto tried out.

BY-PRODUCTS FROM SLUDGE.

Some have built their hopes upon methods designed to obtain some valuable by-product from sewage sludge—particularly fats, which are present in considerable quantities. Others have pinned their faith to methods for dewatering and drying sludge with the idea that the dried product will prove saleable as a fertilizer. A few believe that the B.T.U's in dried sludge, (4,000 to 5,000), will make it valuable as an ingredient to incorporate with coal dust in briquettes for fuel purposes. This last proposition is so absurd from the economic standpoint that it is merely referred to.

THE GREASE AND OILS IN SEWAGE.

Grease may be obtained from sewage in two ways: a—by mechanical means of separation which are not very efficient and b—by chemical means, which involves the employment of expensive chemicals to acidify the sludge. One such method, the Miles Acid Process, depends on the fact that sulphurous acid gas, a comparatively cheap material, when added to sewage, breaks up the soaps and frees the fatty acids which become entrapped with the colloids and solids of the sludge and are separated with them. When such acid sludges are dried copious fumes of sulphur dioxide and acrolein vapours are given off and the grease obtained by abstraction and distillation gives extraordinary amounts of tar and unsaponifiable matter.¹¹

Even when treated by the Cobwell Process in which degreasing takes place simultaneously with dehydration, the results are grease and fatty acids, which have no marketable value at the present time, and a low grade 3% ammoniate. A town of 150,000 people would yield five tons of tankage and one ton of grease daily, but as the grease has value only when it has been refined and made into marketable products, it may readily be seen that no income can be expected from such a process and from that viewpoint the process may be dismissed from our discussion.

The sludge obtained at the Baltimore sewage disposal works in 1915 with sulphuric acid treatment had a very objectionable odour and dried on sand beds much less readily than good non-acidified sludge; no manufacturer would even consider the proposition of taking the fat which might be obtained from the Baltimore-sewage works.

From this it may be seen that the acid process at present holds out few inducements or hopes of successfully solving any of the main difficulties of sewage disposal, though it may have a place in the disposal of trade wastes.

THE FERTILIZER VALUE OF SEWAGE SLUDGE.

Numerous experiments have shown that the dried sludge from sewage disposal works is a valuable fertilizer. Of the various kinds of sludge the activated sludge has a higher nitrogen and phosphoric acid content, is more readily available for plant growth and is therefore, the most valuable as a fertilizer as Bartow,²¹ Nasmith and Mackay¹³ and others have shown by many comparative tests with vegetables.

Imhoff sludge is also valuable as a fertilizer and is used with great success in growing vegetables in the vicinity of the main Toronto Sewage disposal works. In Baltimore 25c. a load is paid for the dried Imhoff sludge produced at the works.

At Milwaukee it is expected that the dried activated sludge will be sold as a fertilizer base, the price being based on the nitrogen content.

Improvements in dewatering sludge by centrifugal action or other means, or improvements in methods of digesting sludge may entirely change our present attitude with regard to sewage disposal and make one or other system the much more desirable.

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DISCUSSION ABSTRACTED FROM THE CANADIAN
ENGINEER.

At 2.45 p.m., Wednesday, the municipal section resumed its consideration of the activated sludge process of sewage disposal. Willis Chipman complimented Dr. Nasmith very highly on his paper, which Mr. Chipman declared to be the fairest possible exposition of the present status of the sewage disposal problem.

F. A. Dallyn, engineering adviser to the Ontario Board of Health, related his experiences in regard to the activated sludge

problem, declaring that many of the old plants in the province can be reconstructed along the lines of this process cheaper and with better results than can be obtained in any other way. Mr. Dallyn also told of his trips to England to investigate the process, and of the efforts that have been made to dewater the sludge by pressing and centrifuging. The organic life in sludge contains 80-90% of water. Sludge is a consolidation of this organic life plus mineral matter. Fresh sludge reduced to 70% of water is near its best state of consolidation after pressing or centrifuging, depending upon the mineral matter present, he declared, and we cannot hope to get further along those lines. Whether the sludge can be reduced by biological means is another question. He understood that experiments along these lines had been successfully carried out by Dr. Watson, of Birmingham, and similar experiments had also been undertaken by the Ontario Board of Health, and had been successful to a marked degree.

The problem of disposal of the sludge is not one that is likely to bother small municipalities, said Mr. Dallyn. At Brampton, Ont., the disposal has caused no difficulty, and at Houston, Tex., the sludge has been lagooned without trouble. He would not care to predict exactly what the future of the process would be, but he was satisfied that within 15 years the problem will have been entirely solved. The activated sludge process is here to stay, he said, although some modifications of the methods of disposing of the sludge must naturally follow.

Mr. Dallyn drew attention to the fertilizer value of the sludge. He declared that the abbatoirs are gradually converting their product into feed for stock and chickens, and that they are withdrawing from the fertilizer business, and this field will in the future be open for the development of the sale of activated sludge. The Board of Health had conducted a number of experiments, said Mr. Dallyn, in regard to the fertilizer value of activated sludge, and had found that it hastens early maturity of the crops, as its nitrogen content is in readily available form.

I. H. Nevitt, who is in charge of the Morley Avenue sewage disposal plant at Toronto, stated that his main plant averages 3 1-3 cu. yd. of sludge per million gallons of sewage and has a water content of 80 to 82%, while the sludge from the small experimental activated sludge plant at Morley Avenue carries 89.8% of water. He did not care to quote any figures in regard to quantity of the activated sludge.

Mr. Nevitt described the efforts that are being made at Houston to dry the sludge with presses and indirect dryers, and at Milwaukee, Wis., with a Basco-Ter Meer machine. They had obtained a reduction of the water content to 70%. There are 35 of these machines in operation in Germany, where they were developed during the war, said Mr. Nevitt. The capacity of each machine is approximately 4,000 U.S. gal. per hour.

There are two plants at Houston, explained Mr. Dallyn. At the one, the sludge is being lagooned; at the other they are trying pressing and drying, but the dryers are not yet in operation, and there are yet some difficulties to be overcome. The sludge sticks to the conveyor, but the company that installed the conveyor is replacing it with another type which it feels certain will handle the sludge satisfactorily.

Willis Chipman called attention to the necessity for efficient practical operation of these plants. Many years ago, he said, the septic tank was the standard sewage disposal plant. He recently was in a small town where he was asked to examine the sewage disposal plant, and he found a septic tank that was full of sludge from top to bottom, with the raw sewage running through it. If that is the way the septic tanks are handled what can we expect, he asked, of the activated sludge process, with possible interruptions of power and air supply, unless there is some constant supervision on the part of the Provincial Board of Health or other authority? If there is no such constant supervision, the activated sludge process will be a failure in the smaller towns. The spraying filters can readily be fixed when repairs are needed, but the maintenance of machinery in connection with the activated sludge process and the disposal of the sludge are two problems that yet must be satisfactorily solved before the activated sludge process can be safely entrusted to the smaller municipalities of Ontario.

William Storrie, of Gore, Nasmith & Storrie, said that his firm had recently been consulted by an Ontario municipality in regard to sewage disposal, and they had been forced to tell the city that they were not warranted in going ahead with any programme of sewage disposal at the present time, as in their opinion we are just on the verge of important developments in the art of sewage disposal.

Mr. Dallyn: The Board has since 1909 operated an experimental station to examine and develop processes for the treatment of sewage and purification of water in order that the Board might direct the municipalities along safe and economic lines of development.

Mr. Dallyn stated that the Ontario Board of Health has consistently held up sewage disposal programmes for the past five years, believing, as did Mr. Storrie, that there would be developments. The only programmes which the Board had permitted to advance, he said, are those which have been forced upon the municipalities by legal proceedings that have been taken against the municipalities for causing nuisance.

Educational Possibilities

BY MRS. L. A. HAMILTON.

Read at the annual meeting of the Canadian Public Health Association, Vancouver, B.C., June 21st, 1920.

SEX EDUCATION.

IN recent years a large number of the most enlightened people have turned to education in their search for progress towards the solution of the great sexual problem; it is from experience of such people that I will draw, in laying before you some arguments in favour of sex education.

"Education," says Maurice A. Bygelow, of Columbia University, "has become the modern panacea for many of our ills, hygienic, industrial, political and social. In every phase of life we are looking to knowledge as the key to all significant problems. It is truly the age of education, not education offered in schools and colleges, but education in the larger sense, including the learning of useful knowledge from all sources whatever. It is most natural, therefore, that we should turn to it in these times when we have come to realize the existence of amazing sexual problems caused either by ignorant misuse or deliberate abuse of the sexual functions.

"If education is to solve the civic, hygienic, and industrial problems of to-day and to-morrow, why should it not also help with the age-old sexual evils.

"Now the problem of educational attack on sexual disharmonies is so new and so immense that it has seemed best to label this phase of education by a special name.

"Sex education in its largest sense includes all scientific ethical, social and religious instruction and influence which directly or indirectly may help young people prepare to solve for themselves the problems of sex that inevitably come into the life of every normal human being. Note the carefully guarded phrase 'help young people prepare to solve for themselves the problems of sex.' For like education in general, special sex education cannot possibly do more than help the individual prepare to face the problems of life."

Again. In the opinion of Dr. Helen Wilson, Lecturer for the British Council for Combatting Venereal Diseases,—

"When we speak of education we mean something much wider and much deeper than warnings about particular evils. Such warnings are needed, but they may be actually mischievous unless they have, as a background, some sound knowledge of the normal and the good. Facts alone, whether they be facts on health or disease, are not sufficient.

"Who is to undertake this great task of education?

"It should not be left to special teachers; there is a real danger of focussing the attention of young people too much on this particular aspect of life; the teaching should be largely incidental and should come naturally in the ordinary course of education.

"Most people are agreed that the foundations should be laid in childhood. There is less agreement on the question as to who is to lay these foundations. It ought to be the parents, and there are to-day parents in all classes of society who are discharging their duty admirably, but it has to be acknowledged that a very large proportion of parents are unable or unwilling to undertake the work. Hence the school is called upon to do it for them. Even if the home is all it should be the school would still have to play a part in supplementing the work of the parents. Thus, on the teachers of to-day is laid a double and a very heavy task."

Someone has aptly said, "We must teach the teacher to teach the parent to teach the child."

It is wholly logical and practical for teachers well prepared in biologic branches to introduce details in their courses that shall wholesomely and progressively enlighten pupils from kindergarten through to High School concerning the transmission of life and the need of physical integrity therefor.

It is not necessary to teach evil. The laws of nature are wholesome and fascinatingly interesting to every normal child, provided the instruction is qualified and clean-minded.

Sir Francis Champneys, M.D., points out in a very informative pamphlet how elementary school teachers can help in the campaign against venereal disease.

1. By their direct influence on their scholars.
2. By indirect influence through the parents.

Two of the most frequent and pressing questions which confront the parents are:—

1. What shall be the mother's attitude?
2. When should sex education begin?

Dr. Beatrice Webb answers these questions as follows:—

"There is no doubt in my mind that it is the mother's duty and privilege as regards her girls and her little boys, with help from the father for the latter, as they grow to be about twelve. The duty must not be shirked, for it is not a question of the child being told or untold. If the mother does not explain, the child will learn in some other way, possibly in an undesirable way which may sadden its whole outlook upon life.

"The *time* for teaching is clear. It is as soon as the child asks. The child who is old enough to ask an intelligent question is old enough to have an intelligent answer. The age must vary with the make up of the child's mind.

"The earlier such teaching can be given the better, for to the little child 'the world is so full of a number of things,' so many of them mysteries, that it takes them all simply without astonishment. This mystery of birth and new life is accepted quite calmly as just one among the rest, and put away in the mind with others.

"*What* is to be taught is also clear. The truth and nothing but the truth. There must be no lies. The little child is very logical, also keenly instinctive; it knows when lies are told to it, and so comes to distrust grown-ups and becomes increasingly curious and sets about getting knowledge in some other way and saying nothing to those who have deceived it."

That a normal child, normally and decently taught, will regard these things naturally, is well illustrated by a story recently told me by a mother of her own little girl. The child had been much interested and somewhat impatient about a hatch of chickens, and remarked: "Mother, it takes a long time for little chickens to be born, and I want some kittens. Do cats lay eggs?"

The mother's spontaneous reply of "No, they lay kittens," brought out a satisfied and vehement exclamation of "*How* convenient!"

I will pass on now to another side of this question.

How do the older children, the adolescent group themselves regard sex education?

James E. Peabody, head of the Department of Biology in Morris High School, New York, answers this question in his pamphlet, "Sex Education in the Home and High School."

"Three years ago," he says, "we started a new course in biology for the upper classes. In this advanced course we discuss very frankly, even in mixed classes, the reproductive process through the mammals, and the relative importance of heredity, environment

and training. We emphasize especially the tremendous importance of right choices in marriage. The outline of my talk includes:—

"1. The process of reproduction.

"2. Hygiene of the reproductive organs.

"3. Heredity.

"I have had anywhere from ten to forty boys at these various afternoon conferences, and the same work is undertaken for the girls by a woman graduate of Vassar.

"Before leaving the conferences both boys and girls are asked to answer anonymously in writing half-dozen questions.

"It is noteworthy that 78 per cent. of both boys and girls had not been taught the facts of sex by the parents or other relatives. Fifty-five per cent. of the boys had heard that sexual intercourse was necessary for health, although one boy remarked, 'I did not believe it, because of the health of monks and holy men who are noted for purity.'

"Asked as to their judgment of the value of these conferences both boys and girls were very definitely in favour.

" 'Absolutely necessary,' wrote 23 per cent., while others said, 'The most essential things I ever heard.'

" 'They ease one's mind.'

" 'They should be given in all schools.'

"I think such things as sex conferences are the most important and the most interesting things that I have heard since in school.

" 'Prevents girls from going wrong.'

" 'Clears up many mysteries in my mind.'

" 'Why can't we have more of these classes? They are just what we've been longing for.'

" 'The evil results from self abuse were never so brought home to me.'

" 'I have learned much concerning things that I feel would have done me good some time ago.'

"With regard to the girls, 85 per cent. of the mothers expressed hearty approval, 6 per cent. made no comment, and 8 per cent. disapproved.

"A great deal of literature is now to be found approved by the different organizations and produced by individuals and thinkers. We find that there is a great demand for all of this, especially amongst mothers. This covers the field of helping the parent, as well as giving literature direct to the child. The book, 'The Cradle Ship,' is particularly beautiful and can be read to a child of three. I feel that in a good many of the biological books more courage

might be shown when the question of human reproduction is dealt with. So often here writers seem to fail and to become frightened of their subject. It is granted that it is difficult to explain matters to the children, but there seems to me a great danger of writers suggesting mystery and something "not nice" by falling short at this point.

"It seems to me evident, in view of all that has been quoted, that a great and new responsibility now rests upon any whose eyes and ears are open to the miseries and despair of those who justly say: 'Why was I not told?'

"Before closing I wish to warn against a tendency at the present time to emphasize the medical and biological side of the sex problem to the exclusion of the spiritual. It is admitted that religious teaching has in the past treated this problem indirectly and ministers will assure us that the catechism instructs young people to "keep their bodies in purity and chastity"; but unexplained and uninterpreted these words are a mere shibboleth not understood by the average child and often not appreciated till too late.

"The religious side of the question *can* be given intelligently, and I venture to say that plans of instruction will break down unless they have a religious foundation and carry with them something of the fundamental Laws of God and of the punishment for their infringement.

"We should, however, not over-emphasize the religious appeal, nor, on the other hand, make it obscure, but it must be plainly pointed out that the body is the Temple of the Living God.

"Just a word in closing about love and marriage.

"We need to set up better ideals for both.

"At present there is a great outcry about divorce and the breaking up of Christian homes. If homes are Christian, that very fact will keep them from disruption, but it is hypocrisy to call those homes Christian where people hate each other or are miserable and desperate—nothing more unchristian could be imagined. None of us who are decent like the idea of divorce made easy, but those who rail against divorce under any circumstances would be best employed by turning their attention to education for love and marriage and to fostering the real love instinct and home ideals. This will in the long run do more to prevent divorce than any fulminating from pulpits against the unhappy, the ill-assorted and the mismatched.

"It would be well for them to hold up love and marriage as very sacred gifts to be attained, and to set their faces against making them the subject of light jest and banter.

"In an article in the June Atlantic Monthly, called 'Boys and Girls,' Annie Winsor Allen, who has taught and studied boys and girls for a full generation, makes this pertinent statement:

" 'We must gradually, as fast as we can, give up the idea that sex is funny. If we think of it as a purely scientific physiological phenomenon of rare significance and extraordinary power, the time-worn jokes will cease to enter our consciousness and our conversation, because they will be actively irrelevant. There will be no association of ideas to draw them out. For we shall know that sex is our greatest blessing and shall co-operate heartily to banish all the mismanagement which makes it a curse.

" 'But to the suggestion that the sex-joke has got to go, the world says, "Impossible! It is as old as Adam!" Yes, and the drink-joke is as old as Noah, and the hell-joke is practically dead in educated America, and the drink-joke can hardly raise a smile, it is so feeble. The first has died because children are no longer threatened with hell and grown people no longer think about it. The second is moribund because liquor is less and less familiar to children and by grown people it is more and more disused and disapproved. A joke needs a basis of familiar reality from which to turn its somersault. Even now the sex-joke has disappeared where the grown people have ceased to misuse sex, and the children regard it simply as a scientific fact. Thus science is rapidly removing many of our old-time errors and the reliable old jokes that went with them. Nature is never funny. Fun implies choice, and there is no choice about a scientific fact. It is merely so.'

"We might with such education hope to see marriage entered into with more seriousness and less haste and selfishness. I will conclude by quoting from Mrs. Pethick Lawrence's article on 'Education in Love.'

" 'The child that has not gained from its first lover, its mother, its earliest vision of the delight of friendship and the great creative magic of love has been defrauded. We know how to hate, as Diderot said, but we have not learned how to love. We have not yet learned, but by making ourselves once more as little children, we can begin to find our way into this Kingdom of Heaven and take possession of it. From the hearts of little children must spring that future era to which we turn with hope from the wide-spread

desolation of to-day. Our task is to prepare the ground and sow the seed. Let us do it with the realization that it is by love alone that men and women may be transformed into likeness with the Creator and can enter into vital union with the whole creation of which they are a sentient part. Thus shall we pass on to our children, with the knowledge and understanding of love, the full inheritance of life.' "

The Prevalence of Malnutrition in the Public School Children of Ontario

ALAN BROWN, M.B. and G. ALBERT DAVIS, B.A., M.B.

PREVIOUS to the war very little attention was paid to the question of malnutrition in older children, but in the examination of recruits so many men were found to be unfit for military services as a result of conditions following malnutrition, that attention was then brought to bear on the condition as it appeared in children. It was found in the drafts for the United States army that one man out of five was unfit for active military service on account of physical disabilities brought about by malnutrition. Unfortunately we have not the corresponding figures for the Canadian army, although it is probable that the same proportion of disability would be present in our own country.

Surveys to ascertain the extent of malnutrition existing among school children have been made in various places. In New York, in the borough of Manhattan, of approximately 175,000 children who were examined 2.15 per cent. were found to be undernourished¹ A recent writer² mentions 40 per cent. of a certain school in Kansas City as being undernourished. Many other surveys have been made in England and in the United States, but as far as we are aware no such work has been undertaken anywhere in Canada. With the idea of determining how much malnutrition was present in Canadian cities a survey was made of some of our Toronto schools.

There are various standards that one may adopt in determining the existence of malnutrition. The one which we have chosen is the relationship of weight to height, irrespective of age. The height and weight chart employed by us was prepared from measurements by Boas and Burke for older children and for the earlier years from approximations of records by Holt. Altogether the heights are averages of 45,151 boys and 43,298 girls, and weights of 68,000 boys and girls. It is to be noted that the chart is different to that of Wood's where age is taken into considera-

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tion. The reason for adopting the former set of standards in preference to Wood's is, that we feel the correct method is to disregard the age of the child, and to consider his height and weight only.

The survey was made in conjunction with the Department of Public Health of this city, through which department the nurses, who did the actual measuring and weighing, were supplied. Heights were taken with boots on, and an allowance made for the height of the heels. A little experience in this matter soon makes one quite proficient. Similarly, with the weights, allowances of one-half to one and a half pounds were made for boots according to the size and appearance of the latter.

The original intention in making the survey was to choose four schools representing the different types of our school population. To these four schools, however, has been added a fifth, where a mental survey of each child was being carried on under the direction of the Canadian National Association for Mental Hygiene. In this instance measurements and weights were made by the same individual making the mental survey, and these records have been added to our own.

The first school surveyed was York Street, where there is practically eighty per cent. foreign population. This school is situated in the down-town warehouse and small shop district. In this locality the population is very cosmopolitan, and includes Chinese, Japanese, Russians, Jews, Italians, and so on. Following this the children of Brown School were weighed and measured. This school is located in one of the best residential districts of the city, and contains children of parents in good financial circumstances. Withrow School, consisting of children of middle class parents, and Dufferin School, with children of the lower type of English-speaking people, were the remaining two schools chosen. Western Avenue School, where the mental survey was also made, is in a good residential district; and socially stands between Brown and Withrow Schools.

In estimating the amount of malnutrition in the various schools, two standards have been employed. Emerson states that a child 7 per cent. or more underweight for his height is malnourished, while Holt consider a child 10 per cent. or more underweight for his height up to ten years of age and 12 per cent. from ten to sixteen years as belonging to this class. Both determinations have been made. In Tables 1, 2, 3, 4 and 5 will be seen in order the results obtained in the various schools. For convenience the results of each school have been placed together as seen in Table 6. Our

results in these schools have been so striking that an estimate based on the relationship of weight to age was made in two schools, Withrow and York, and the results are seen in Tables 7 and 8. In Table 9 the results have been tabulated according to the grade in school in order to see whether there existed any difference in the amount of malnutrition present at the various ages. Finally in Table 10 will be seen the results of the mental survey made in conjunction with the nutritional survey. This was done to determine if possible whether there was any relationship between malnutrition and mental backwardness, as evidenced by the Binet-Simon method.

When we come to analyze our results we see that the greatest amount of malnutrition is present in the children of middle class people of native birth. The well-to-do, as also the foreigners, show the least amount of malnutrition. In Table 9 we see that malnutrition varies only to a slight extent in the different grades, and that it does not tend to decrease as the child gets older. From Table 7 it will be seen that the children in Withrow School, which probably holds true for the children of other middle class schools, are tall for their age; while the foreigners in York Street School (Table 8) are short for their age. These latter findings confirm us in our belief that the correct method of determining existent malnutrition is by the relationship of weight to height, irrespective of age. We, therefore, feel that the height and weight chart used in this survey is the best obtainable at the present time, and in the majority of instances shows the correct state of the child's malnutrition.

The mental survey made in one school of 336 children confirms the results found by Blanton in the public schools of Trier, Germany; namely, that malnutrition, even when prolonged, affects to a very slight degree the intelligence of a child, as determined by the Binet-Simon method. However, children suffering from malnutrition shows a lack of physical and nervous energy which results in poor school work, and generally affects behaviour so that these children often appear listless and stupid. This latter finding is in agreement with the opinions of those handling classes of malnourished children, whose experience has been that as the state of a child's nutrition improves so does his mental condition.

SUMMARY.

1. Of 2,843 children examined, 1,256 or 44 per cent. were 7 per cent. or more underweight and 751 or 26 per cent. were 10-12 per

cent. or more underweight. Some may not be disposed to consider a child 7 per cent. underweight as malnourished, but a child 10 per cent. or more underweight is surely in a serious condition, and needs attention.

2. Estimating our total school population as 79,000, 26 per cent. or 20,540 are undernourished and in a serious state of health.

NOTE.—The authors are indebted to E. J. Pratt, Ph.D., for the mental survey conducted by him under the direction of the Canadian National Association for Mental Hygiene, and to the Misses Wheeler and Emory and the nurses in the various schools attached to the nursing staff of the Department of Health, for the routine weighing and measuring of the children.

References:

1. "Malnutrition among school children," in weekly Bulletin of the Department of Health, City of New York, vol. 7, March 9th, 1919, page 75.
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5. EMERSON.—"A Nutrition Clinic in a Public School," *Amer. Jr. Dis. of Children*, vol. 17, 1919, page 251.
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TABLE 1.

YORK ST. SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	25	36	14	20	68
Junior & Senior 1st.....	18	25	9	212	70
Junior Second	5	17	1	3	29
Senior Second	10	28	4	11	34
Junior Third	11	27	1	17	40
Totals	69	28	35	14	241

TABLE 2.

BROWN SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	31	32	18	19	96
Junior First	29	32	16	18	89

Senior First	28	43	21	32	65
Senior Second	25	20	13	10	127
Junior Third	38	24	3	2	158
Senior Third	43	31	26	10	136
Junior Fourth	39	31	21	17	124
Senior Fourth	25	27	13	15	88
Totals	258	29	131	14	882

TABLE 3.

WITHROW SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	39	51	25	32	76
Junior First	49	56	36	41	86
Senior First	40	56	29	40	71
Junior Second	32	45	17	24	70
Senior Second	54	67	33	41	80
Junior Third	42	51	23	28	82
Senior Third	59	56	38	36	104
Junior Fourth	28	53	22	42	52
Senior Fourth	19	38	9	18	49
Totals	362	54	232	34	670

TABLE 4.

DUFFERIN SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	51	75	39	57	68
Junior First	95	71	66	49	133
Senior First	66	62	40	38	105
Junior Second	43	57	25	33	75
Senior Second	45	58	25	32	77
Junior Third	32	43	12	16	74
Senior Third	35	50	20	29	69
Junior Fourth	26	53	14	28	49
Senior Fourth	12	33	3	8	36
Junior Fifth	11	57	8	42	19
Senior Fifth	3	33	2	22	9
Totals	419	58	254	35	714

TABLE 5.
WESTERN AVENUE SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Junior First	8	28	3	11	28
Senior First	3	20	2	13	15
Junior Second	24	46	17	32	52
Senior Second	7	33	6	28	21
Junior Third	26	33	8	10	77
Senior Third	42	60	24	34	70
Junior Fourth	25	54	12	26	46
Senior Fourth	13	48	7	26	27
Totals	148	44	79	23	336

TABLE 6.

School.	7% or more per cent.	10% or more per cent.
York Street 80% foreign	28	14
Brown School	29	14
Western Avenue School	44	23
Withrow School	54	34
Dufferin School	58	35

TABLE 7.
WITHROW SCHOOL—WEIGHT TO AGE.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	20	26	10	13	76
Junior First	20	23	12	14	86
Senior First	16	22	12	17	71
Junior Second	15	21	8	11	70
Senior Second	25	31	13	16	80
Junior Third	20	24	12	14	82
Senior Third	31	29	20	18	107
Junior Fourth	19	31	13	21	62
Senior Fourth	17	28	11	18	60
Totals	183	26	111	16	694

TABLE 8.
YORK STREET SCHOOL—WEIGHT TO AGE.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	25	36	15	22	68
Junior First	5	16	4	12	31

Senior First	20	51	16	41	39
Junior Second	8	27	6	20	29
Senior Second	11	32	6	17	34
Junior Third	14	35	7	17	40
Totals	83	34	54	22	241

TABLE 9.

MALNUTRITION—ACCORDING TO GRADE IN SCHOOL.

Grade	7% or more	Per cent.	10% or more	Per cent.	Total
Kindergarten	146	47	96	31	307
Junior First	199	49	130	32	406
Senior First	137	53	92	35	256
Junior Second	104	46	60	26	226
Senior Second	141	41	81	24	339
Senior Third	179	47	108	28	379
Senior Third	179	48	108	28	379
Junior Fourth	118	43	69	25	271
Senior Fourth	69	34	32	16	200
Junior Fifth	11	57	8	42	19
Senior Fifth	3	33	2	22	9
Totals	1256	44	731	26	2843

TABLE 10.

Average Intelligence Quotient for 94 normal and over-weight children—101 per cent.

Average Intelligence Quotient for 45 7% to 10% under-weight children—101 per cent.

Average Intelligence Quotient for 104 10% or more under-weight children—98 per cent.

Social Background

City Committee on Unemployment

Buffalo, N.Y., 1920-1921.

STATEMENT and recommendations of the following committee appointed by the Buffalo Bureau of Public Welfare, December 18, 1920: Frederic Almy, chairman; Dr. Frances M. Hollingshead, secretary; John J. Aeschbach, E. J. Barcalo, Rev. J. C. Carr, Theodore L. Richmond, Frank E. Wade, Cecil B. Wiener.

This same committee is also the Committee on Unemployment of the Buffalo Social Welfare Conference, established in 1889, which is composed of seventy local social agencies.

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| 1. Public Work. | 6. Classification. |
| 2. Private Work. | 7. Promptness. |
| 3. Part Time Work. | 8. Advertising Relief. |
| 4. Charitable Funds. | 9. Un-befriended. |
| 5. Work Tests. | 10. RECOMMENDATIONS. |

HOW TO MEET UNEMPLOYMENT

Buffalo, N.Y., Dec. 30, 1920.

The following suggestions are drawn chiefly from the elaborate 1917 Report of the New York City Committee on Unemployment, appointed for the winter of 1914-15. In 1916 the committee issued a report on what was done, and in 1917 a fuller report on what to do next time, for the committee believes that preparedness is the best preventive.

Almost equally valuable are the issues of the Labor Legislative Review for November and for June, 1915, describing especially public relief work.

The Charity Organization Bulletin for November, 1914, has valuable suggestions and warnings as to the approaching crisis. Then, as now, the chief charity organization societies of the country had a weekly exchange as to conditions and action.

"In the opinion of competent observers the difficulties all go back to one root cause—failure to act in advance of the emergency." (Review, p. 573). Preparedness may halve the trouble.

1. PUBLIC WORK.

"We are too prone to forget that the only adequate remedy for unemployment is employment." (N. Y., p. 12).

In 1914-15, "at least twenty-four cities appointed Mayor's Committees, or joint committees of public officials and private citizens." (N. Y., p. 50; Review, p. 498).

In Buffalo in 1914-15 no public work was given except snow shovelling. The number sleeping on the floor in police stations, as reported daily to the C. O. S. rose to 500. This stopped on January 9th when the city opened quarters for 200 men at the Broadway Auditorium, with bath and meals, and on February 6th, for 500 more in a warehouse on Lloyd Street, where men slept on the floor but had two meals.

Better than this, less debasing, and without more cost to the City, would be public work when available. Stoppage of work means stoppage of income, and with the majority of workers resources are soon exhausted. Men of the better sort want work, not relief, and this the relief societies are not organized to supply. The city has work to give, as well as funds. "Fifty-six cities report public work for the unemployed in 1914-15, and 52 report that it was successful." (Review, p. 575). It is possible in winter, "to undertake outdoor improvements at a normal cost in spite of the employment of many men not previously experienced," but this requires efficient supervision and selected men. (N. Y., p. 85).

Already, in 1920, a few progressive mayors have made an appeal to the various public departments, City, County and School, to promote public enterprises. Rather than spend money for debasing relief which the better men do not want, the City should expedite all needful public work, limiting it strictly to residents, and to men physically fit, and giving preference to married men, or giving them more days work per week than the single men, so that decent sustenance is possible without more aid.

Bids on twelve public schools are to be opened January 19, 1921. Winter building may be unprofitable, though a new theatre is now being built near Main street, but immediate work could be done on these 12 sites, in excavating and clearing, either by the City direct

or on separate contract. In November, 1914, Chicago reported that three new schools would be built at once instead of in the spring.

Possibly other public work for the City or County could be advanced to meet the emergency, such as the proposed development of Bird Island as a recreation park, a driveway on the north side of Scajaquada Creek, or the making of advance supplies for City and County institutions. In 1914-15 Alameda, Cal., had its health department records indexed, as relief work; in Cleveland, women made garments for public institutions; and in St. Louis, bathing suits for the City swimming pools.

Oppressive summer heat may delay work as much as winter cold. "In Dayton, O., it is officially stated, water pipe was laid with the ground frozen eighteen inches deep at a lower cost than under the usual conditions." (Review, p. 571). Detroit has found the digging of sewers in frozen ground no more expensive than under the blazing summer sun." (Review, p. 183).

In Duluth, which has "adopted the policy of building sewers throughout the winter in order to equalize the amount of employment." (Review, p. 183) the Commissioner of Public Works says, (Review, pp. 571, 576) that it was "done as well and as economically as by ordinary methods." The frozen surface proved "of decided advantage in retaining the walls of the trench in position." "Every man was required to do a good day's work. . . . Good management is imperative. . . . The success of this work depends largely upon the intelligence and competence of the foreman." Over 50 cities, some with severe winter climates, made similar reports. (Review, pp. 183, 571). Where City work must be by contract, or where City funds were not immediately available, various devices were used. (Review, p. 572).

City governments may find it more advantageous to undertake extensive improvements at times of depression as regards a favourable money market, or plentiful supply of labour, lowered cost of materials, and eagerness of contractors." (N. Y., p. 35). In France and Germany cities deliberately reserve for slack periods such public work as is not urgent, in order that, like a sponge, it may absorb unemployment.

2. PRIVATE WORK.

Trade depression is largely psychological, due to sudden conservatism which decreases spending when it should increase. "The effects of trade depressions are accentuated and prolonged by the

exaggerated conservatism in spending which is apt to take hold of the consuming public during such depressions." (N. Y., p. 120). Private employers and individuals can help greatly by advancing repairs and alterations contemplated, and by purchasing imperishable household goods in advance of actual needs.

Indoor relief work is especially valuable in winter, and 1914-15 various social agencies opened work-rooms for "chair-caning, simple cabinet-making, cobbling, weaving, basketry and every conceivable kind of repairs to clothing and household articles." (N. Y., p. 98). "None of the articles made were sold in the open market." They "provided supplies for institutions supported from charitable contributions" and many were sent to the war zone of Europe, (and could still be so used) without competing with local industry.

The warning is given that "in the case of emergency employment everything almost is in favour of enterprise on a small scale." (N. Y., p. 92). There is less malingering, closer supervision, more variety, and suitable quarters can be found with less delay, or free of cost.

Bread lines and soup kitchens are universally condemned as unnecessary, indiscriminating and debasing, though bakeries, hotels, etc., with a surplus of perishable food which in normal times is wasted, might give on card to accredited persons; but "the provision of a nourishing meal at the emergency workshops in certain localities and under certain circumstances is decidedly helpful. During the winter of 1914-15, the (New York) Mayor's Committee on Unemployment was fortunate in securing the generous aid of 51 of the leading hotels and restaurants, and three clubs, in providing nourishing meals at 12 of the emergency workrooms." (N. Y., p. 108).

3. PART TIME WORK.

Better than relief or relief work is part time work by large employers. "The unemployment and distress may be largely, perhaps entirely, diverted by an intelligent spreading of the available employment over as many wage-earners as will give each of them a sufficient income to weather the storm." (N. Y., p. 14). "Such distribution of work, during the unemployment crisis of 1914-15 was by far the most potent influence in warding off distress. The Mayor's Committee addressed an earnest appeal to employers in the city to put employees on part time rather than reduce their working force." (N. Y., p. 24).

The warning is given that "with low-paid unskilled work, where at normal times the earnings of a full week only just suffices to support life," part time may increase distress, though generally helpful. "Care must be taken that the weekly earnings of the men employed do not fall short of the minimum requirements for the maintenance of the home." (N. Y., p. 86).

"In the building industry four weeks after a personal appeal to the Employers' Association, it was reported that 2,400 more men were employed under special arrangements for part time work than could have been possible without it. In the printing trades the unions themselves took action to withdraw members from their work for one day, and at times two days, in each week so as to lessen the number of those wholly unemployed. In any future period of depressed trade and industrial slackness, undoubtedly part time employment again will have to play a prominent role as the most effective means of preventing unemployment." (N. Y., p. 24).

Various forms of part time work are suggested. A shorter working day for the whole force is recommended, and gives "pep" to the work done. Closing for half days, or one whole day, each week "is immediately beneficial to the employees and thereby indirectly to the output." (N. Y., p. 26). "We do not feel at all apologetic in adding to the appeal of self-interest that of the public concern." (N. Y., p. 25). Shifts are also useful, and are better than reduction of force, which exposes "part of the normal working force to inactivity, mental distress and maybe starvation . . . and the loss from the installment and training of a new working force when business improves, should the dismissed employees seek and find employment elsewhere." (N. Y., p. 25). "We wish to propose that employers' organizations in each industry where they exist create standing committees as their special contribution to a city-wide preparedness programme against unemployment." (N. Y., p. 26). "It is suggested that the conclusions of the separate committees for the several industries be correlated, as far as practicable . . . by some suitable agency of the City government, or the Chamber of Commerce or the Merchants' Association." "Where employees are members of trade unions the labour policy to be agreed upon should, naturally, be a co-operative one." (N. Y., p. 26).

4. CHARITABLE FUNDS.

It is said that in New York City in 1914-15, in spite of large sums spent upon relief employment and charity in various forms,

"there is not the slightest doubt that" the result of the provision made "to steady trade and keep people at work, together with the aid obtained by unemployed working people from trade unions, from credit institutions and from their own savings, was enormously greater." It should not "be necessary during a time of business depression to maintain able-bodied and willing workers out of charitable funds." (N. Y., p. 15).

New charitable agencies in an emergency, and large central agencies, widely advertised, are universally condemned. A central agency is invaluable for distributing information, to save applicants from being sent from pillar to post for work or aid, but a large central relief agency attracts unnecessary applications, and the better class of retiring persons, who shrink from exposing their urgent need in a crowded office, will dislike to apply.

Large central relief agencies also tend to close up the smaller ones, which is not as good as "making use of neighbourhood knowledge and diffusing relief through a hundred channels in close touch with individual persons and families, instead of one having no knowledge of them prior to their application for aid." (N. Y., p. 91).

"One of the needs most clearly shown during the crisis of 1914-15 was that of reassuring the public by authoritative statements that" existing agencies "were fully competent as well as willing to handle all the needed relief work, provided they were financially enabled to do so." (N. Y., p. 55).

Relief should be decentralized, and churches, the small societies, and individuals should help those known to them rather than unload upon central agencies. "In the panic of 1907 there were actually some 30 agencies that gave less relief and did less work than in the years of normally good times preceding." (Bulletin, p. 131).

5. WORK TESTS.

"Emergency relief employment cannot be used merely as a work test. . . . Work tests, under the best of circumstances, are of doubtful value. If a man be registered with a trade union or public employment office as willing to accept work under normal conditions on reasonable terms, that should suffice to establish his bona fides." (N. Y., p. 100). Mothers with young children who need their care should not be forced to unfamiliar work as a test, or electricians and narrow-chested tailors sent to a stone-pile.

As a work test it is suggested that "if a wood-cutting firm will check its steam-saw, utilize the services of selected men instead, and report accurately on the industry of each man, the arrangement has the advantage of displacing no independent labour. . . . One plan which has worked well is to induce charitable or other organizations to give indoor day's work which would not otherwise be paid for, such as scrubbing, window cleaning, dish washing and laundry work, to selected men and women, the society paying for the work after receipt of a careful report. This service avoids congestion, especially if arranged where no worker need travel unreasonably far." (Bulletin, p. 136).

Of course there must be some discrimination between voluntary and involuntary idleness. The New York City committee recommend that registration at some employment bureau for at least a week without being able to find work be obligatory as a condition to work relief, or any relief. (N. Y., pp. 126, 48).

6. CLASSIFICATION.

In emergencies many want to do away with "red-tape" by helping without inquiring, but some classification is essential. Men of 60 and boys of 16, single and family men, hoboes and steady workers, cannot be treated alike. "The committee, then, submits as its first recommendation that, no matter how severe the unemployment crisis, a sincere effort should be made to classify those in need in some way not inconsistent with rapidity of action, so as to determine what kind of relief the individual is most in need of, or which is most likely to be appropriate to his or her capacity for self-help, possession of resources, station in life, family responsibilities, age, health, sex, etc." "Wholesale aid which does not allow of variation in kind and amount with the various needs of the beneficiaries is not only wasteful, but also ineffective, slow rather than quick, humiliating rather than stimulating. It misses its very object." (N. Y., p. 48).

7. PROMPTNESS, FITNESS.

"First of all, we must visit every applicant with absolute promptness, within 24 hours at the very latest. Any slower service in emergency times means fundamental failure, and the nerves of the charitable will be steadied, moreover, by the assurance that prompt service is being given." (Bulletin, p. 136).

"Second only to promptness comes adaptability. . . . Our relief should make a loan to one without any work test whatever, should try another's capabilities by some temporary test, should give another the hardest work that can possibly be unearthed for him, should stave off the landlord's eviction notice for a fourth, place the fifth in a hospital, send the sixth and his whole family to the country, provide cash for the exceptionally provident buyer who is the seventh, relieve the improvident eighth sparingly with supplies plus conditions, and turn the ninth over to the social agency or the church which is largely caring for him." (Bulletin, p. 137).

8. ADVERTISING RELIEF.

Advertising relief funds attracts non-residents and floaters in spite of all notice that they will not be aided, and so defeats its own object. It is well to advertise relief stations, but not relief resources. If the poverty of relief only is advertised, subscriptions are increased and applications lessened.

In Buffalo in 1893 a widely advertised relief fund of \$63,000 brought non-residents and fakirs, and "out of 3,450 of the earlier applicants, 2,006 did not live at the address given." (Bulletin, p. 123).

"To discourage advertised centralization, however, is to double our responsibility for discovering and giving the best possible service to unbefriended cases of real need. This responsibility can be met by carefully planned approaches to school principals, clergymen, neighbourhood workers, workingmen and patrolmen. In 1893 one society in a small city asked each manufacturer to name a workman whom the shop trusted. These were invited to a meeting, and the plan worked out of placing a notice in each factory to the effect that cases of need were to be reported to the workman named. The name of the society did not appear on the notice, but these shop representatives were organized into one of its auxiliary committees." (Bulletin, p. 136).

9. UN-BEFRIENDED.

As has already been set forth, savings and credit should be used as far as possible and employers and churches should do all they can to take care of their own through part time employment and direct relief. The city and chief societies, should be called on only for those who are otherwise unbefriended.

RECOMMENDATIONS OF UNEMPLOYMENT COMMITTEE APPOINTED BY
THE BUREAU OF PUBLIC WELFARE, AND BY THE BUFFALO
SOCIAL WELFARE CONFERENCE.

Whereas, In the opinion of competent observers the difficulties in periods of unemployment all go back to one root cause—a failure to act in advance of the emergency; and

Whereas, The only adequate remedy for unemployment is employment.

We make the following recommendations:—

1. Immediate public work, indoor or outdoor, of every available sort, as less costly and less debasing than public relief. The work should be limited absolutely to residents, and preference given to family men, who might have three or four days' work a week, while the single men could be limited to one. Only needful work should be done, and unless the work is given only to selected men, and the supervision is of the highest quality, there will be waste. A little extra cost might be justifiable, however, in an emergency. The work should be at regular rates of pay and time.

2. An immediate effort to enroll all employers in co-operation for part time work instead of dismissal of men, using shorter hours, or full or half-day holidays instead of reducing the force. This is said by the New York City Unemployment Committee of 1914-15, to be "by far the most potent influence in warding off distress," and "the most effective means of preventing unemployment."

3. Suitable dormitory provision for single men, confined so far as possible to residents.

4. A relief fund, not widely advertised, and limited so far as possible to residents with families.

5. No central relief station, but a central bureau for information only.

6. Classification of all applicants (for efficiency and humanity) so that steady workers and hoboes, men of 60 and lads of 20, family and single men, shall not be treated alike.

7. Promptness, so that every applicant will be visited without fail within 24 hours.

8. Support of all existing agencies, rather than the creation of new ones which will be inexpert.

9. Decentralization, by urging employers, churches, and all local agencies to do all they can to take care of their own, so that the City and the chief societies shall be called upon only for those who are otherwise unbefriended.



The Provincial Board of Health of Ontario

COMMUNICABLE DISEASES REPORTED BY LOCAL BOARDS OF HEALTH FOR THE MONTH OF DECEMBER, 1920.

COMPARATIVE TABLE.

Diseases.	December, 1920.		December, 1919.	
	Cases.	Deaths	Cases.	Deaths.
Small-pox	555	5	1,433	2
Scarlet Fever	711	17	557	17
Diphtheria	778	74	744	65
Measles	973	7	1,026	14
Whooping Cough	335	16	214	9
Typhoid	59	25	51	21
Tuberculosis	181	114	111	98
Infantile Paralysis	7	3	7	2
Cerebro-Spinal Meningitis ..	7	7	26	9
Influenza	39	9
Influenzal Pneumonia	6	3
Primary Pneumonia	242	188
	<hr/> 3,651	<hr/> 522	<hr/> 4,169	<hr/> 425

VENEREAL DISEASES REPORTED BY MEDICAL OFFICERS OF HEALTH.

Diseases.	Dec., 1920.	Dec., 1919.
	Cases.	Cases.
Syphilis	229	109
Gonorrhoea	269	110
Chancroid	9	5
	<hr/> 507	<hr/> 224

The reports of Local Boards of Health for Communicable Diseases for the last month of the old year shows small-pox is more prevalent in the Province than any month since March last. With the exception of the cities of Ottawa and Brantford, the cases may be considered more sporadic than epidemic as the 555 cases reported are from 29 counties affecting some 71 municipalities. Five deaths occurred during the month. The total cases for the year 1920 are 5,169 with 33 deaths.

The number of cases of diphtheria are the greatest for any month of the year, and the deaths are only 6 less than the month of February, when 80 were reported, being the highest death rate for the year.

Scarlet fever cases also are by far the greatest number of any month, but the number of deaths are comparatively small.

MUNICIPALITIES REPORTING SMALL-POX.

County	Municipality	Cases	Dths.	County	Municipality	Cases	Dths.
Algoma.—	Sault Ste. Marie	7			Middleton	1	
	Blind River	4		Northd. & Dur.—	Ainwick	1	
	Rydal Bank	17		Ontario.—	E. Whitby	5	
	Plummer	4		Oxford.—	Blenheim	1	
	Poplar Dale	9			Tillsonburg	2	
Brant.—	Brantford	61		Parry Sound.—	Byng Inlet	1	
	Tuscarora	2			Tarling Village	1	
Bruce.—	Brant	5		Perth.—	St. Marys	2	
	Elderslie	1		Prescott & Rus.—	Clarence	2	
Carleton.—	Ottawa	161	1		Rockland	4	
	Nepean	3		Prince Ed. Is.—	Wellington	7	1
Elgin.—	St. Thomas	8			N. Marysburgh	16	
	Bayham	2			Ameliasburg	6	
Frontenac.—	Kingston	5			Hillier	1	
	Kingston Tp.	1			Pictou	3	
Grey.—	Sydenham	3			Bloomfield	3	
	Bentick	1		Simcoe.—	Orillia	3	
	Sullivan	9			Coldwater	2	
Hastings.—	Belleville	28			Penetanguishene	1	
	Stirling	6			Midland	1	
	Rawdon	6		Sudbury.—	Sudbury	2	
	Dungannon	6			Massey	1	
Huron.—	Brussels	3		Stormont, D., G.—	Finch T.	1	
Lincoln.—	Niagara Town	1		Temiskaming.—	Tisdale	1	
Middlesex.—	London	6		Waterloo.—	Galt	3	
	Strathroy	2	1		Kitchener	12	
Muskoka.—	Gravenhurst	1			Waterloo Town	20	
	Bracebridge	13		Welland.—	Bertie	3	
	Draper	2			Pt. Colborne	1	
	Macaulay	1		Wellington.—	Guelph	1	
Nipissing.—	Sturgeon Falls	7			Harriston	2	2
	Springer	3		Wentworth.—	Hamilton	19	
	Mattawa	13			E. Flamboro	1	
	Madawaska	1		York.—	Toronto	30	
	Dugal	1					
Norfolk.—	Woodhouse	2				555	5

PETERBOROUGH EXAMINER (WEEKLY EDITORIAL),
THURSDAY, JANUARY 27th, 1921.

In the case of Dr. A. S. Thompson, M.O.H., vs. the Township of Belmont and Methuen argued before Judge Huycke here in the Division Court, His Honour gave judgment for the plaintiff, Dr. Thompson, who brought suit against defendants—Belmont and Methuen township—to recover \$86 for work performed by him on order of the Provincial Board of Health in making a sanitary survey of the township schools.

Plaintiff stated that the work was ordered by the Provincial Board, but the local Board had refused to sanction it and had told him that it would not be paid for his services.

Reeve Griffith for the defense, stated that he thought the law was unreasonable and that the municipality had not received any benefit from the survey, and on that ground he had refused to sanction payment for the account, and relied for his defence upon the by-law appointing Dr. Thompson, which stated that his salary was to be based upon his tariff of fees for work performed by order of the local Board of Health.

Judge Huycke in his judgment said both parties had invited trouble by leaving status of salary so glaringly indefinite, and that the Doctor should not have accepted office under such a by-law, and that the municipality should never have expressed any such terms in the by-law. He held that Dr. Thompson was entitled to his claim for the work performed in accordance with the amount asked for, \$86.00, in that he was also a provincial officer by virtue of his appointment, and in duty bound to carry out the orders of that body.

O. A. Langley of Lakefield, for the plaintiff, F. D. Kerr of Peterborough for defendants.

THE USE OF PHENARSENAMINE.

The following letter has been sent out by the Provincial Board of Health to all physicians in Ontario:

Toronto, Jan. 28th, 1921.

Dear Doctor:—

The following suggestions are sent to you with the approval of the Ontario Medical Association and will appear in Canadian Medical Journals in due course. It is hoped that these suggestions may be of some value to you in your practice.

In the administration of Phenarsenamine—(the Provincial Board of Health "606" preparation), or other arsenical preparations for the treatment of syphilis, the following points should be carefully considered:

A. Before Treatment:

1. Minor acute illnesses (such as colds, bronchitis, etc.), should be considered temporary contra-indications to intravenous treatment. It should be remembered that, occasionally, under Arsenical treatment, chronic skin diseases may become acute.
2. A fat person does not, as a rule, tolerate the drug so well as a spare muscular person.
3. Before antisyphilitic treatment is begun a urinalysis should * be made.
4. The night before the administration of the drug a laxative should be given.
5. Solid food should not be taken by the patient for at least six hours before treatment.
6. The initial dose should not be more than 0.3 grams in men or 0.2 grams in women.

B. Treatment:

1. "606" preparations are more stable than "914" ones.
2. The treatment should be given with the patient in a recumbent position with the head slightly raised on a pillow.
3. With 606 or Phenarsenamine the solution should never be given more concentrated than 0.1 grams to 20 c.c. of freshly distilled water.

With neo preparations a concentrated solution 0.1 grams of the drug to 3 c.c. freshly distilled water may be used, provided it is given very slowly at a rate not exceeding 0.6 grams in two minutes. More dilute solutions given by the gravity method are less likely to cause reactions than concentrated solutions, particularly if the latter are rapidly administered.

4. The drug should be administered immediately it is prepared.
5. The strictest asepsis should be observed.

* An acute kidney lesion should be considered a contra-indication to the use of arsenical preparations.

C. After Treatment:

1. After administration the patient should be kept quiet (preferably recumbent) and under observation for at least half an hour. A hypodermic solution of adrenalin chloride should always be readily available for injection at the first sign of any reaction.
2. No solid food should be taken by the patient for at least four hours after treatment.
3. If signs of dermatitis or jaundice appear treatment should be discontinued.

Mercury should be given as part of the treatment. Intramuscular injections or inunctions appear to be the best method of administration.

Yours truly,

JOHN W. McCULLOUGH,
Chief Officer of Health.

The Public Health Nurse in Ontario

BY J. J. MIDDLETON, M.B., D.P.H.

THE Public Health objective is to improve the health standard of all classes in the community, and to this end ways and means are being provided for educating the masses along the lines of public health and practical hygiene, supplying practical measures to preserve the health of the expectant mother, to bring home to mothers the importance of feeding infants rationally—that is, at the mother's breast, or failing this by scientific adjustment of cow's milk, sugar and water; to correct physical defects in young children, to prevent the spread of communicable diseases, and to lessen the incidence of disease in industrial occupations.

Although people of all ages are becoming increasingly interested in general public health matters in the Dominion, the need for which has been strikingly demonstrated by the great losses we sustained during the war, it is in childhood and youth that the most lasting impressions are made in teaching an important subject such as the preservation and maintenance of health. With this end in view the Public Health Nurse has stepped into the field, and her work is bound to bring most important results. She is the pivot in every community around which and from which all public health activities will radiate, for she alone is in a position to get intimately acquainted with the needs of the district, and to direct her energies along the lines in which they are most needed.

The duties of the Public Health Nurse will include home visiting, which will be carried out in a systematic manner, and will enable her to stimulate local interest in child welfare, and also detect, if possible, any cases of communicable disease such as tuberculosis, that are not under medical supervision.

The Public Health Nurse will point out such dangers, and will also report any cases of venereal disease or mental defectives that come under her notice. In her demonstrations, and in the holding of child welfare clinics the duty of the nurse will be, moreover, to work towards the ultimate establishment of a Health Clinic, in which Maternal and Child Welfare conferences, nutritional classes, consultations for tuberculosis and heart affections, and a dental service for adults and children may be provided for. The special province of the nurse is the health of expectant mothers, infants

and children, and she will endeavour to impress on mothers the fact that no food for infants is as good as that which nature intended for them. In addition, the nurse by means of home visiting becomes acquainted with conditions in her district, and gradually increases the sphere of her activities to include work along the various lines mentioned, until the health centre is a real factor for good in the life of the community.

In order that the Public Health demonstrations being given at present throughout Ontario may prove of permanent value, it is hoped that each district visited will decide to appoint a resident nurse to carry on the work begun. Although the sixteen nurses in the field only started two or three months ago, they have already demonstrated their usefulness, and the important results that will undoubtedly be brought to any community if their teachings and practical advice are carried out. Recently the Provincial nurses attended a round table conference in Toronto, which was also attended by the eight District Medical Officers of Health.

In any instance where lack of enthusiasm in the proposal to appoint a permanent nurse has been shown, it is only on account of the financial obligations that would have to be undertaken. This is the report that comes in from every section of the Province where Child Welfare Clinics have already been held.

The nurses have found that their demonstrations and the programme they have in view are appreciated by all classes in the community. Taking the standard of other progressive countries who consider one nurse to every 2,000 of the population a reasonable estimate for the country's needs, the Province of Ontario requires 1,000 Public Health Nurses.

The United States already has 10,000 of these nurses in the field, but are still 40,000 short of their ideal. Even with this shortage, authorities claim that a saving of 18,000 lives in one year has been largely effected.

Ontario is not lagging behind in this important feature of Child Welfare, and although the work has only just begun, the nurses are enthusiastic and predict important results from the work being carried on when the people have been sufficiently educated in Public Health to recognize its permanent value.

News Items

There are nearly 200 persons working on the various committees and sub-committees of the Toronto Branch of the Canadian National Council for Combating Venereal Diseases. Active committees include: Finance, Programme, Membership, Medical, Literature, Social Aspects, Speakers.

Additional committees to be formed in the near future include a Committee of Nurses and a Publicity Committee. Important parts of the campaign being undertaken in Toronto are lectures given in factories by National Council speakers and lectures to be given to audiences of school teachers and to parents.

The Venereal Disease Division of the Dominion Department of Health have recently issued valuable booklets on various aspects of the Venereal Disease problem. Titles of the books issued to date are as follows:

"Information for Young Women about Sex Hygiene."

"Information for Parents—Teaching of Sexual Hygiene to Children."

"Venereal Diseases—Microscopic Examination."

"General Circular of Information Concerning Venereal Diseases to the Medical Profession of Canada."

These pamphlets are printed both in French and English.

A synopsis of work done during 1920 has been issued by the Ontario Safety League. They carried on a voluminous correspondence with manufacturers, motorists, and others asking co-operation in the prevention of accidents and fires; showed motion pictures to school children; distributed safety literature in over 100 cities and towns in Ontario, held an essay on drawing contest, and in October the league conducted an intensive "Safety Week" drive.

The 50th annual meeting of the American Public Health Association will be held at New York City in November, 1921. The date which is tentatively announced is November 14-18.

It is interesting to note that Dr. Stephen Smith, the founder and first president of the Association, is now entering his 99th year. He is still active and vigorous, and it is expected to celebrate his approaching centennial together with the semi-centennial of the Association.

The first organization meeting of the Association was held in New York City on April 18, 1872, and that is one of the reasons for selecting New York City for the celebration of the semi-centennial. Other considerations are the convenience to foreign representatives, and to Dr. Smith, who lives in New York City; and especially a plan to conduct demonstrations of public health administrative methods in the laboratories, executive offices, garbage disposal plants, and similar centres of public health interest, in which New York City is unsurpassed.

It is expected to present in connection with the celebration a review of the progress of the various branches of public health within the last fifty years. The sectional programmes will include Public Health Administration, Vital Statistics, Laboratory, Food and Drugs, Sociology, Sanitary Engineering, Industrial Hygiene, and Child Hygiene.

The Health Week, which was planned for St. John, N.B., for week of January 31st, has been postponed till April.

Dr. J. T. Phair has resigned his position as Director of School Medical Inspection, Department of Public Health, Toronto, to become Chief School Medical Officer for the Province of Ontario under the Department of Education.

Dr. John S. Douglas has been appointed in charge of the branch laboratory of the Provincial Board of Health of Ontario, which has just been opened at North Bay.

A conference of Public Health Nurses in Ontario will be held on February 11th.

"Actinafed Sludge Process in Sewage Disposal" was the subject of a valuable paper by Dr. G. G. Naismith, and an interesting discussion followed a paper on "The Toronto Filtration Plant" by James Milne, as to relative costs of operation of slow sand and drifting sand filters. These papers were presented at the annual meeting of the Engineering Institute of Canada on Feb. 2nd.

Toronto will have a milk campaign early in May. This is being arranged by the Child Welfare Council of the city. The C. P. H. A. is assisting in every way to make a real success of this effort and to stimulate the holding of similar campaigns in other cities. Particulars may be obtained from the Association Office, 206 Bloor Street West, Toronto.

Editorial

A Unique Experiment

A SOMEWHAT unique plan of co-operation between a voluntary organization and a Government is that presented in the arrangement whereby the National Council for Combating Venereal Diseases in Great Britain undertakes to do propaganda work for the Ministry of Health. A scheme whereby a voluntary organization succeeds in doing work necessary for the success of government schemes and at the same time retains the essential initiative characteristic and necessary in a voluntary body is one worthy of careful examination in Canada. Voluntary bodies dealing with specific problems generally render valuable aid in the forward march of public health because they are composed of persons who are really interested in a particular problem for its own sake. A well organized voluntary body generally means rapid progress, more rapid than could be achieved by any governmental machine for reasons that are fairly obvious.

At the same time voluntary organizations in the past have nearly always been hampered by lack of funds. The way of the reformer—and voluntary organizations are reformers and pioneers—in this respect has commonly been hard. In Great Britain the pathway of the National Council for Combating Venereal Diseases has been made smooth by the Government—with the result that Government plans for the control of Venereal Diseases have progressed much more rapidly than they otherwise would.

The National Council for Combating Venereal Diseases virtually acts as a Government agent for the disbursement of funds locally for propaganda work. Money is only spent for propaganda with the joint consent of the municipality or county involved and the Ministry of Health. Where money is spent locally on propaganda under this joint scheme there is a reimbursement to the extent of seventy-five per cent on the part of the Ministry of Health. It is understood that since this plan has been evolved and during its operation over a period of years the happiest relations have existed between the Government and the National Council. At the same time the National Council has retained its voluntary character, has continued to enlist public sympathy in its problem, collected public

funds and undertaken original investigations of a valuable character.

Such a relation between the Government and voluntary organizations would seem to be ideal in that it tends to prevent the voluntary organization from getting out of hand and at the same time gives the Government the opportunity of enlisting public support in a unique and thoroughgoing manner. It has been suggested that a similar relationship might well be established in Canada between the various provincial branches of the Canadian National Council for Combating Venereal Diseases and the Provincial Governments and already a number of Provincial Health Officers have expressed themselves as in favour of such a development. The Venereal Diseases problem is a tremendously complicated one. Extensive propaganda work is necessary and also many new developments in the direction of education of both parents and children, recreation, rehabilitation of sex offenders, organization of clinics and of social investigation in connection with clinics, jails, police courts and reformatories, in addition to a great deal of medical investigation. If progress in these various direction is to be rapid it will only be as the result of organizing the various forces at work. The provincial and municipal committees of the Canadian National Council for Combating Venereal Diseases provide the opportunity for getting the forces together. They are all, however, confronted with the problem of finance. Until some money is provided paid secretaries and offices are out of the question. With this nucleus provided as in Great Britain there is no doubt that tremendously increased activities would be evident at once. It is to be hoped that the matter will be given careful consideration in the various provinces and that some measures of financial support on the part of provincial governments and possibly municipalities will result.

The Coming Convention, Toronto, May 16, 17, 18, 1921

THE Executive Committee after careful consideration and consultation with the members of the Executive Council have decided to call the 10th Annual Convention of the Association, on May 16th, in Toronto. This step was taken believing that it was unwise to choose a convention city in the extreme East this year, since last year's meeting was held in the extreme West. The

choice of Toronto was made, because the Ontario Health Officers' Association of whom a very large number are members of the C.P.H.A., had already chosen Toronto for their annual meeting. It is the policy of the Association to unite with the Health Officers' Association in holding the annual convention when such an organization exists in a province. In 1917 a Joint Meeting was held in Quebec with the Quebec Health Officers, and in 1919 with the Ontario Health Officers in Toronto.

A Committee was appointed by the Executive to meet with the Ontario Health Officers' Association and plans were discussed for a joint meeting. Invitations were then extended to the Canadian Association for Prevention of Tuberculosis, Canadian National Council for Combatting Venereal Diseases, and the Canadian National Committee for Mental Hygiene, to join in planning for a convention of special importance. The invitation has already been accepted by the two former association, and the programme is being drafted.

The programme committee has decided to make a radical departure from the usual type of public health convention. It is planned to devote two, or possibly three of the sessions to the study at first hand of the work of modern public health clinics. The clinics will include Child Welfare, Ante-natal, Malnutrition, Venereal Disease, Tuberculosis, and Psychiatric, and a time-table for these has been carefully arranged so that those attending the convention can see the clinics actually being carried on. In order that the different clinics may be of most value, special material will be presented so that the methods in use may be clearly demonstrated. Modern laboratory methods will be demonstrated by the Laboratory Section in such a way that those in attendance who are not conversant with laboratory methods may see the technique and the various steps in practical work. Visits are planned to the Filtration Plant, Sewage Disposal Works, and to other places of interest. Several speakers are being invited, whose presence should be of special interest. This does not mean, however, that opportunity will not be given for presentation of papers and discussions. Papers for Section meetings should not occupy more than 15 minutes, and should be addressed to the chairman of the section. These include:

Mental Hygiene.—Col. C. K. Russell, 386 Sherbrooke Street W., Montreal.

Social Hygiene.—Rev. Arch. Deacon Symonds, Christ Church Cathedral, Montreal.

Child Hygiene.—Dr. M. M. Lindsay, 52 McGill College Avenue,
Montreal, P.Q.

Laboratory Workers.—Dr. R. H. Mullin, University of British
Columbia, Vancouver, B.C.

While papers which are to be presented at the various section meetings are to be addressed to the chairman of the section, papers for the general session should be addressed to Dr. R. D. Defries, General Secretary, 206 Bloor Street West, Toronto.

United States Public Health Service

HOW DUSTY IS YOUR PLANT?

All industrial plants are dusty. But how dusty is the air in any particular plant? Knowledge as to the degree and composition of such dust is important, for certain amounts and sorts of air dust seriously affect the lungs and predispose those who breathe them to tuberculosis and other diseases.

Dr. O. M. Spencer, of the U. S. Public Health Service, discusses the matter in a recent report of the Service. He shows that neither the fact that the exhaust pipes, etc., required by law appear to be properly functioning nor the use of wet instead of dry processes in grinding, polishing, and the like make it at all certain that the dustiness in a given plant is what it should theoretically be. He finds that many exhaust pipes do not in fact exhaust as they are supposed to do; and that under certain conditions some wet processes create much more dust than dry ones. Only actual "dust counts" at the plane of the work show the real dustiness of the air that the workmen must breathe; and such counts should be made periodically to check the theoretical conditions.

To determine how unhealthful the dustiness of any particular plant process may be, the composition of its dust should be ascertained and its effects interpreted by standard tables, which Dr. Spencer urges should be worked out for the various industries. Different industrial processes produce dusts which differ greatly in injurious properties.

HEALTH HAZARDS IN LUMBERING REGIONS.

Health problems in lumbering regions are being investigated by the U. S. Public Health Service as part of a general study into occupational diseases and industrial hygiene undertaken in Florida at the request of the State Board of Health. The work has not yet gone far enough to permit important deductions to be drawn; but it seems to show that the problems are not essentially different from those obtaining in other lumbering districts of the South and,

indeed, in other parts of the country, except in that they show a high incidence of malaria and hookworm diseases. The results should be generally interesting.

Dr. J. A. Turner, of the Public Health Service, who was sent to Florida with instructions to ascertain the special needs of the workers and to make recommendations to the State Board of Health as to the best ways of meeting them, has first taken up the lumbering industry and has found that this involves two sorts of problems, the first pertaining to the actual working conditions, and the second to the reactions of the more or less transitory lumbering population and of the permanent residents on each other.

Study of working conditions involves investigations of processes of production, medical and surgical care, sanitation of camps, and food supply; and study of reactions includes investigations into the economic condition of the residents, prevalence of transmissible diseases, malaria, and venereal infection and possibilities of soil pollution.

The object of the work is, of course, to reduce sickness, accidents, absenteeism, and labor turnover; and thereby to obtain increased efficiency and greater economic prosperity for both workers and employers.
